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John E. Jackson

Instituto de Tecnologia Agropecuaria, San Luis, Argentina

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JOHN E. JACKSON, Instituto de Tecnologia Agropecuaria, C.C. 17, 5730 Villa Mercedes, San Luis, Argentina.

ABSTRACT: In Argentina, 41 of the country's 300 native or introduced land mammals are legally considered as pests: 31 are indigenous and 10 exotic. The types of problems arising are described and the principal species causing them are reviewed. Although inflicting damage, several wild animals are also valuable for commercial hunting enterprises.

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INTRODUCTION

With a surface area of 3.76 million km^2, Argentina is the seventh largest country in the world and the fourth of the American continent. It has a diversity of habitat types ranging from subtropical rain forest to polar ice pack, pampas grassland, Chaco thorn forest, Patagonian steppe, and high Andean Puna. Argentina produces a wide range of crops, forestry products, and livestock. Besides its native terrestrial mammalian fauna, comprising 300 known species, at least 17 others have been introduced from both the Old and New Worlds. Hence, a wide variety of situations exist in which man's interests and those of other mammals may clash. Under existing federal and provincial legislation in Argentina, 41 species of terrestrial mammals are considered pests or undesirables; 31 are native and 10 introduced (Godoy 1963).

TYPES OF PROBLEMS

Areas of conflict between human interests and mammalian wildlife's habits in Argentina can be broadly divided into:

a) predation
b) drop in livestock-carrying capacity on range or pastures by reduction in suitable forage and/or habitat degradation
c) losses in rentability in agricultural crops or forestry
d) alteration of natural ecosystem reserves
e) commensal species and associated problems
f) epizoonosis and zoonosis

Some pests fall into more than one category.

PROBLEM SPECIES

The puma (Felis concolor) kills an undocumented number of calves, sheep, goats, and foals in range conditions and may be an important factor for livestock concerns locally. Losses are apparently accentuated where hunting, control campaigns, or fires have reduced alternative natural prey. In sheep-rearing Patagonia, the red fox (Dusicyon culpaeus) is estimated to take 3 to 15% of lambs (Howard 1969, Simmons 1973). Belatti (1984) found this canid responsible for 60% of predator attacks on lambs, killing 1 to 5% of the viable young. Fox attacks may be more common in areas of broken terrain, and include predating yearling sheep; goat kids may also be hard-hit. Grey pampas foxes (D. gymnocerus) may take lambs, especially in northern Patagonia and La Pampa. Opposums (Didelphis albiventris) and skunks (Conepatus spp.) are locally troublesome in hen houses and on poultry farms. First reports of feral mink (Mustela vison) killing livestock and native wildlife are coming from Andean foothill watercourses in Santa Cruz (Garrido pers. comm.).

The European hare (Lepus europaeust was first introduced into the Pampas in the late 19th century for sport-hunting and is now found practically throughout mainland Argentina (Griega and Rappoport 1983). They cause severe damage to agricultural and forestry concerns and important reductions of quality forage species on range (Amaya 1978). Hares are normally tolerated on permanent pastures where commercial hunting for meat exportation may control their numbers. Approximately 6 million hares are shot annually for their meat, which is exported to Europe at a f.o.b. value of U.S. S20 to 30 million; pelts, fur, and live animals for restocking Old World hunting areas are also shipped abroad (Fujita and Calvo 1981, Jackson 1986).

The European rabbit (Oryctolagus cuniculus) has been present in Argentina for about the last 50 years (Howard and Amaya 1975). According to a recent review of this species status in Argentina (Bonino and Amaya 1984), rabbits occupy 45,000 km^2 of central and southern Tierra del Fuego. Maximum densities of 114 rabbits/ha are recorded and cause a marked reduction in forage availability and stocking rates and prevent natural woodland regeneration. Myxomatosis and coccidiosis in young animals are two factors affecting population size (Bonino and Amaya 1984, Robles and Bonino 1984). The native leporid, Svlvilagus. of central and northern Argentina, is not normally a problem.

The cosmopolitan Old World murids-the Norway (Rattus norvegicus) and roof rats (R. rattus) and the house mouse (Mus muscujus)—are found widely as commensal or peridomestic species in most of Argentina, and problems associated with them are akin to those in other countries.

Amongst the Cricetidae, the most noxious agricultural species is the large aquatic rat Holochilus brasiliensis. with a widespread distribution along natural or man-made watercourses in central and northern Argentina. They may cause losses of up to 20% in sugarcane (Massoia 1974) and severely damage rice, horticulture, and riverside or irrigated softwood plantations, especially in the Parana Delta. Control methods

are reviewed by Gurini (1986).

The smaller cricetid rodents are generally herbivores and burrow dwellers. Damage caused by members of the genera Phyllotis. Calomys. Akodon. Oryzomys. Reithrodon, Scapteromys. Oxymyoterus. and Notiomys is difficult to assess and may go unnoticed. Quintanillaetal. (1973)outline the species involved. Massoia (1970) mentions Calomys musculinus. £. laucha. Oryzomys nigripes and Akodon azarae damaging soils, range, and implanted pastures as well as destroying plants and seeds of maize, millet, sorghum, and sunflower. Calomys musculinus. C_. laucha. and *Q*. callosus are associated with the transmission and spread of Argentinian hemorrhagic fever in the central pampas region (Kravetz 1978).

The genus Ctenomys. the tucu tucus, contains about 30 representatives in Argentina. These fossorial and mainly solitary rodents prefer well-drained, sandy soils where their burrowing action and their feeding on roots and vegetation near the tunnel system may result in reduction in forage, vegetation changes, and habitat degradation. Tucus may excavate up to 30 tons of sand/ha/year, increasing soil erosion risks (Contreras and Maceiras 1970). They also cause damage by gnawing citrus and other tree rootstocks, sugar cane and underground cables and irrigation pipes. Populations often cover large areas where they accelerate desertification. In Tierra del Fuego, tucus ruined many thousands of hectares by tunneling and reduced food available to sheep (Massoia 1970). Overgrazing also appears to provide a habitat more favorable for this fossorial animal.

The plains vizcacha (Lagostomus maximus) is a medium-large hystricomorph rodent; adult males may weigh 8 kg. Vegetation around their subterranean colonies is cut short or denuded and they compete for forage with livestock on range. Once found throughout the pampas, this herbivore has been eliminated from more fertile areas but is still common and a pest in semi-arid areas where livestock-overgrazing seems to facilitate the vizcacha colonizing new areas. Llanos and Crespo (1952) calculated that 12 vizcacha consumed the same as one cow, although Jackson (1985) considered this figure an overestimation.

Three species of guinea pig, cavia, or cuises may reach pest proportions. Cavia aperea mav damage rice and willow and poplar stakes in north and central Argentina; Galea musteloides is destructive on range and adjacent crops and forestry in the north and center; and Microcavia australis may strip both ground and shrub vegetation in much of drier western regions (Quintanilla et al. 1973).

Besides the nuisance and health problems associated with commensal bats worldwide, vampire bats (Desmondon rotundus) attack and feed on the blood of man and other animals across much of central and northern Argentina. Blood loss is a minor problem compared to the potential of spreading paralytic rabies, and bat bites provide avenues for many other kinds of infection. In Latin America, losses of livestock by rabies transmitted by this haemotophagous mammal have been estimated at one million head per annum (Burn and Bullard 1980). Many wild mammals also act as a reservoir for Chagas disease (Godoy 1963), which is a major health problem in Argentina.

The muskrat (Ondatra zihethicus) and North American beaver (Castor canadensis) were released as furbearers into Tierra del Fuego about 1948 to provide a source of pelts to boost local resources (Godoy 1963). Both are considered pests today.

Amongst the armadillos, peludos (Chaetophractus spp.) and mulitas (Dasypus spp.) can cause serious damage by burrowing and feeding activities in natural and cultivated grassland and in newlysown cereal fields where these prolific animals may reach higherdensities (Massoia 1970). They are also hosts for trichinosis.

Amongst introduced ungulates, black buck (Antilopa cervicaprat. axis (Axis axis), and red deer (Cervus elaphus) cause grazing conflicts locally. The latter is the most widespread, and numerous of the exotic Cervidae, especially in the central provinces of La Pampa-San Luis and in and adjacent to the Andean national parks of Neuquen, Rio Negro, and Chubut where their impact on the delicate montane ecosystems causes concern.

Wild boar (Sus scrofa) or their crosses with feral pigs occupy a similar range to red deer and are spreading, using permanent water bodies as corridors. They already inflict serious losses in agriculture near wooded areas by feeding and trampling. Wild boar also prey on lambs, goat kids, and newly born calves (Jackson 1987). Occasionally peccaries (Tayassu albirostris and T. tajacu) may feed in fields adjoining forest in the chaquenean region. Guanaco (Lama guanicoe) are not classed as pests but are still hunted and killed in Patagonia as competitors with sheep for grazing and water; pelts from the newborn, or chulengos, also fetch a good price for export. Dense populations of capybara or carpincho (Hydrochoeris hydrochoeris) may cause overgrazing and changes in the sward composition in riparian habitats in NE Argentina and are suspected reservoirs of livestock diseases. Whereas it is or was a serious pest in North America and Europe, the native nutria (Myocaster covpu) is a valuable furbearer in wetlands in Argentina. Up to 4 million wild nutria pelts are exported annually (Fujita and Calvo 1981).

GENERAL CONSIDERATIONS

For many of the "pest" species, data are insufficient to always determine if they really do unacceptable damage and to understand if, how, and why it happens. Knowledge of these vertebrates' bioecology is often insufficient to optimize existing control strategies or to develop new ones. Control measures tend to be erratic and typified by massive officially promoted campaigns to eradicate or drastically reduce the problem species. Schemes to monitor pest populations and guidelines for action are inadequate. Apart from urban pest control operations, few people are trained in vertebrate pest control at either operator or assessor levels. When adopted, methods to solve the problem tend to focus on eliminating the animal rather than seeking alternative solutions or modifying husbandry practices.

Human safety, potential hazards to nontarget species,

and environmental considerations, as well as any existing legislation on product use, may not be fully considered in decision-making or implementation.

Commercial use of wildlife is a significant socioeconomic factor in many rural areas; in the past decade, the value of declared wildlife exports from Argentina in some years has surpassed U.S. $170 million (value f.o.b.) (Fujita and Calvo 1981; Mares and Ojeda 1984). Several of the pest species are hunted extensively for monetary gain. The red and gray foxes, for example, are highly valued for their winter skins, most deer are quarry for trophy hunters, and the European hare is the mainstay of a multimillion dollar meat export industry.

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